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ABSTRACT

The introduction which precedes the two major sections of this position paper discusses the baseline and causes of educational change and some policy alternatives for Federal support of dissemination activities. Following this, part I of the body of the paper offers a statement describing the National Institute of Education's (NIE) program thrust on educational communication and resource utilization. First treated is research on the flow and fate of educational innovations, including adoption decision-making studies and tracer analysis of specific innovations. Next, attention is given to the development and testing of alternative models for NIE's dissemination and utilization program; this section has previously been listed as a separate entry (IR 000 121) with its own abstract. (PB)

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Recommendations for the Dissemination Program of the National Institute of Education Concerning (1) Needed Research on the Dissemination Process, (2) Strategies for NIE's own Dissemination and Utilization Effort. Ronald Havelock and William Paisley.

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RECOMMENDATIONS FOR THE DISSEMINATION PROGRAM OF THE NATIONAL INSTITUTE OF EDUCATION CONCERNING: (1) NEEDED RESEARCH ON THE DISSEMINATION PROCESS, (2) STRATEGIES FOR NIE'S OWN DISSEMINATION AND UTILIZATION EFFORT

The two sections of this position paper were compiled by Ronald Havelock (University of Michigan) and William Paisley (Stanford University), largely from recommendations made by the Research Advisory Committee on Change Processes in Education (RACIPE), a group established by the National Center for Educational Communication of the United States Office of Education. Havelock's section on needed dissemination and utilization (D&U) research derives from RACIPE meetings in the Fall of 1971. Paisley's section on NIE's own dissemination and utilization effort derives from a RACIPE meeting, attended by members of the NIE planning unit, in February of 1972.

Since the sections are self-contained, this prefatory statement can be brief. Some comment is needed, however, on the overall importance of dissemination in education.

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The baseline of educational change

Even the casual observer of American education can see that vast amounts of change occur in each decade, in every state and in most school districts. Most of the change, admittedly, is micro-change -- adjustments in curriculum, pupil arrangements, staffing, etc. The infrequency of macro-change -- the alternative schools movement and the "deschooling" of education -- can be explained by electoral conservatism. Studies show that most voters regard education as an expense rather than as an investment. Per-pupil expenditures are minimized in a society that spends billions on superfluities.

However, cumulative micro-change is a kind of macro-change in itself. Small steps of curriculum reform, individualization of instruction, flexible scheduling and staffing, open space arrangements, etc., lead evolutionarily to the pattern of education described in liberal and even radical writings of ten years ago.

Micro-change, characterized by policy theorists as "incrementalism," is therefore not to be disdained. If all school districts could repeat the sequence of micro-changes that brought advanced districts to their present levels, then American education would rise above most of its shortcomings.

What causes educational change?

Change in the form of growth and adaptation is characteristic of any healthy organism. Much change in education can be explained by educators' professional concern for the "organism" of education. Without dissemination efforts or special incentives, the professionalism of most educators would still motivate them to find solutions for problems that impede the development of their field. Similar concern for organic growth and adaptation can be found in all professions -- it is a hallmark of professionalism itself.

Of course, dissemination helps, and incentives help. Dissemination conveys "images of potentiality" (Ronald Lippitt's apt phrase) and provides practical guidance in proceeding with change. Incentives compensate for the exertions of changing and maintaining a new, higher level of performance. Incentives also "bring along" the less-professionalized educators who would not exert themselves otherwise.

Another cause of change is necessity or coercion. Some changes -- in curriculum, professional preparation, etc. -- are mandated by school boards, state departments, the federal government, or the electorate. If the mandate contains credible sanctions, then change will occur, but usually in a grudging, self-defeating manner. The recent history of enforced bussing is a sufficient example of mandated change and its outcomes.

The inherent flaw in mandated change is its inability to survive the term of the mandate. For example, compulsory school attendance legislation now stands, in the aftermath of the Amish decision, on the brink of repeal. Other groups of parents will offer constitutionally valid reasons for withdrawing their children at the end of elementary school (or not enrolling them at all). When the legislation is repealed, attendance will drop considerably. Wherever coercion was the primary motive for attendance, students will leave. Wherever schools labored to make themselves relevant and attractive, students will stay.

Should federal policy emphasize dissemination and/or incentives?

Despite some successful incentive-based federal programs (such as ESEA Title III) and some questionably successful ones (such as Title I), it is unlikely that the National Institute of Education can build its change strategy on incentives alone. Federal prerogative to manipulate incentives is simply too limited. Incentives take many forms -- money, status, process gratifications, etc. -- but none of these is a federal province. States and local districts control the most effective incentives of money and status. Barring a radical reorganization of American education, local control of incentives will continue. Under decentralization, this pattern will be strengthened.

The federal government can contribute only a small fraction of local operating budgets. The incentive value of this fraction, broadly distributed across local programs, is negligible. If targeted on just a few areas, federal funds can achieve specific goals. However, success in circumscribed areas is not a precedent for federal incentive funding in general. Even after maximum "leverage" or "margin" is obtained from federal funds, it will still be necessary to emphasize other change strategies.

Strictly speaking, dissemination is not a change strategy but rather a system of activities through which change strategies operate. An incentive-based change strategy uses the dissemination system to make educators aware of the incentive and to clarify behaviors on which the incentive is contingent. A coercion-based change strategy uses the dissemination system for the same purposes, substituting "stick" for "carrot." All change strategies rely upon some form of dissemination to activate change.

However, one change strategy is intimately associated with dissemination per se. This might be called the "images of potentiality" strategy, borrowing Lippitt's phrase. It is related to the "revolution of rising expectations" in developing countries and among disadvantaged minorities in this country. That is, dissemination is almost a change strategy in itself when it shows "the better way" to achieve familiar goals. In the celebrated parable from Daniel Lerner's The Passing of Traditional Society, the grocer

of Balgat was never the same after he saw films of an American supermarket. A supermarket would not make him wealthy in his Turkish village, nor would his status be enhanced (villagers thought him crazy anyway). The supermarket was simply his vision of "the better way." In the absence of change incentives, even in the absence of real change potential, one glimpse converted him to "the better way."

Promoters of change, frustrated by inertia in the American educational system, often stereotype educators as complacent and intransigent. They say that only strong incentives can effect change. However, the stereotype doesn't square with experience. In every school there are educators with visions of "the better way." When ramifications of the change permit, they change their practices unilaterally. If organizational change is necessary, they form committees to bring it about. In many cases they accept heavier work-loads than before, simply because "the better way" has captured their imagination and demands a trial.

Dissemination often fails to effect change because it is mismanaged. "Images of potentiality" are not followed by practical guidance in implementing change. Adverse "side effects" of change are not candidly discussed. Macro-issues of consent and coordination are over-simplified. The result is regression to former practices.

Therefore.....

Policy advisers should recognize the prerogatives and constraints at each level of policy formation. To improve education, local policymakers should be advised on raising money, constructing humane schools, attracting talented educators, etc. State-level policymakers should be advised on strengthening curricula, revising certification standards, coordinating multi-district programs, etc. Federal policymakers should be advised on undertaking basic educational development projects, coordinating multi-state programs, midwifing national goals for education, etc.

Above all, federal policymakers should be advised on establishing a communication network that binds all states and school districts in the collective enterprise of improving education. Using the metaphor of Chester Barnard's The Functions of the Executive, it is the federal education agency that must process information from all sectors of American education to all sectors, always bringing the information to bear on collective goals. Barnard's executive effected change through adroit use of the communication network. The larger the organization, the less control he exercised over other motives and sanctions.

As advisers to the NIE planning unit, we recommend that the Institute be established with a strong dissemination program. Budgeting for the program should encompass the follow-through (such as practical guidance) that is now entering other dissemination programs.

Dissemination entails far more than announcement, and later phases of dissemination are the more expensive.

Experience and research have produced "interim" guidelines for conducting a dissemination program. However, more cost-effective dissemination is possible. Research on the dissemination process itself is needed to move past the "interim" stage.

Insert here latest version of

Havelock's paper on needed

research focusing on the

educational dissemination

and utilization process

(recommendations to NIE

planning unit, 12-71).

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Statement on NIE Program Thrust on Educational Communication and Resource Utilization

Prepared for the NIE Planning Unit (Attn. B. Sprunger)
by
Ronald G. Havelock
December 1971

The NIE is being established to bring large scale reform and renewal to American education. However, in a free society which allows maximum individual choice and autonomy at all levels, major changes do not come automatically or easily. Indeed, as voluntarism increases, the complexity of introducing change increases also. For this reason the National Institute should concern itself with the study of educational change and renewal as a process. Research studies and programatic research and development efforts should be undertaken to discover and design the optimum procedures for diffusing, adopting, and implementing new educational programs, products and practices.

Research and development on the change process should be aimed toward the eventual redesign of educational institutions at all levels from the USOE to the classroom so as to increase the efficiency of knowledge transfer and resource utilization and to enhance the capacity for rational free choice among educational alternatives. In broad terms, this program will require research thrusts along three paths: (1) research to assess the current state of change and decision making processes in U.S. education, (2) a search for and assessment of creative alternatives, both procedural and institutional, which could improve this process. Such creative alternatives should be sought in at least three places: (a) educational establishments in other nations; (b) advanced or notably innovative public and private schools in the U.S.; and (c) adaptable mechanisms from fields other than education, e.g., medical and technical information systems and agricultural extension services; and (3) experimental programs to design, fabricate, and field test innovations in knowledge transfer and utilization based on (1) and (2) above. These experimental innovations might include new types of institutions for resource linking and training at national, regional, or local levels, new types of specialist roles in resource linking, new programs of in-service training for educational decision makers, and new information systems or system components to assist the user in gaining access to the best available knowledge in the shortest possible time at the lowest possible cost. As such experimental programs demonstrate their effectiveness, they should be transferred to the National Center for Educational Communication or to the appropriate state or local jurisdictions for extended field testing and implementation.

In developing a specific program for the first year of operations, the National Institute would be well advised to consider the research program priorities for educational communication studies set forth by an advisory task force of the NCEC in September of 1971. Task force members included:

Richard Carlson	Center for Advanced Study of Educational Administration, University of Oregon
Robert Chin	Human Relations Center, Boston University
Neal Gross	Graduate School of Education, University of Pennsylvania
Ronald Havelock	Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, The University of Michigan
Ronald Lippitt	Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, The University of Michigan
Matthew Miles	Program in Humanistic Education, State University of New York at Albany
William Paisley	Institute for Communication Research, Stanford University
Everett Rogers	Department of Communication, Michigan State University

This task force sees three areas as needing immediate attention.* First and most important is a topic area they identify as "research studies on the flow and fate of educational innovations." A second priority is for research and development on more satisfactory models of training for resource utilization, and a third area of great importance is in the development of of improved methodologies to assess innovations and their consequences. Each of these three areas will be outlined briefly below.

A. RESEARCH ON THE FLOW AND FATE OF EDUCATIONAL INNOVATIONS

There is a national responsibility for helping schools adopt or adapt educational innovations, particularly when those innovations have their origins in federally sponsored research and development. However, specific and empirical knowledge is lacking about (a) how innovations reach school systems, and (b) how such innovations are accepted and implemented once received. Without such knowledge of the process of innovation, the USOE is unable to provide meaningful and relevant assistance either on specific innovations or on practice improvement in general.

Therefore at least two types of studies should be undertaken to trace the flow of innovations from their origin or invention through mediating systems and channels to the point of actual adoption and implementation within school organizations. One type could be described as "Adoption decision-making Studies" and the other "Tracer" studies.

*These judgments were derived from a systematic review of some thirty topic areas recommended by various scholars as "priorities" for research on educational communication and innovation process. Task force members rated these topics on 12 criteria to arrive at the limited set which is presented here.

Adoption Decision-Making Studies

Not enough is yet understood of the specific processes by which schools take in, implement, and maintain innovations over time. Of particular importance are the mechanisms of organizational decision-making and the pattern of relationships among decision makers within the local district (superintendent-principal-staff-teachers-parents-board-students, etc.). Adoption of educational innovations is a learning and deciding process. Information must be collected, taken into account, and decisions must be made on the basis of such information and sorting. Current knowledge about the change process in schools is inadequate regarding the learning and deciding habits, patterns and activities of school people. If one wishes to stimulate the flow of new ideas and practices among schools, knowledge of the process of learning and deciding about educational innovations must be generated. If one wishes to stimulate the flow of innovations, it is essential that some key questions such as the following be fully answered by empirical research. What channels of communication and what types of messages have the greatest impact on school people linked to these channels of communication? What are the various communication networks and what are their differential impacts? What is the general array of information about educational innovations presented to or available to school people? What types of information have what kinds of meaning to educators as they ponder adoption decisions: what is taken into account and how, and what is ignored? Who or what influences educators most about adoption decisions and how is this explained? What are the patterns of participation by which decisions to adopt or reject are made? How is influence typically distributed within a school or school system as it bears on adoption decisions?

These decision-making studies should be able to compare innovations generated inside the system (inventions) and innovations generated outside the system (adoptions) in terms of acceptance, integration, and maintenance over time. The effects and consequences of adopted innovations, short-run and long-run, anticipated and unanticipated, desirable and undesirable, need to be thoroughly explored in these studies.

Social structural variables would be of particular importance in such studies. A central finding of diffusion-adoption research stresses the importance of the ways in which potential adopters relate to each other and the standing they have with each other in accounting for rates of adoption. Thus, there is every reason to expect that "social structure" variables possess explanatory power whether adopters are individual entrepreneurs or members of a complex organization. Little research has been done on adoption in schools with a view that schools are complex organizations with social structures that vary. Further, social structure has, to some extent, the quality of being designable and alterable. All of this suggests that high priority should be placed on work that searches out the relationship between knowledge utilization and social structure in schools. The social structure variables should include at least assigned roles, internal interest groups, social stratification, beliefs, participation, and dependency relations.

These decision-making studies will have to be undertaken initially as case studies, focusing in depth on one school district or school and perhaps one innovation at a time. However, it is desirable that these case studies follow a common general framework to allow for inter-case comparison and eventual quantification.

Cases should also be selected on some systematic basis, e.g., random selection from a nationally representative sample. Cases might additionally be chosen for their exemplary or demonstration value, or because they seem to represent significant and successful departures from traditional educational practice.

Because of methodological requirements of selectivity and comparability it would appear to be undesirable for NIE to fund these studies in a piecemeal fashion but rather to fund them in one or two major contracts which might in turn subcontract specific cases to individual researchers in different parts of the country.

Tracer Analysis of Specific Innovations

Another set of studies should endeavor to reconstruct the total process of dissemination and utilization by tracing a small number of specific and widely recognized innovations from their points of origin or invention through adoption and utilization in on-going school practice. Studies should note key points in the total process, key individuals, roles, organizations, and channels through which information relevant to the innovation flowed. The studies should be able to delineate at least four subprocesses in the total practice improvement cycle, namely:

(1) the communication of needs from practitioners and policy makers to researchers and developers (need expression: what and how).

(2) the transformation of needs and other information resources into usable programs, products and practices (development: what and how).

(3) the communication of resulting innovations to practice systems (dissemination: what and how).

(4) the acceptance, implementation, utilization, and impact of these innovations within the school system (utilization: what and how).

Tracer studies should follow a structured case study approach which allows cross-study comparison of different linking agencies, channels, messages, and transformations. They should also be designed to pave the way for subsequent quantitative studies providing comparisons of larger numbers of innovations in diverse settings. These initial studies should concentrate on a maximum of five or ten innovations which are reasonably well known, widely adopted and deemed to be more or less successful. Investigators might want to choose both federally and non-federally sponsored innovations, and innovations which differ on certain characteristics such as divisibility for trial, demonstrability, cost, etc.

B. DEVELOPMENT AND TESTING OF ALTERNATIVE MODELS FOR TRAINING IN RESOURCE UTILIZATION

The National Institute should sponsor the development and testing of models of training to facilitate the adoption and implementation of validated educational innovations. There is a need to identify and develop educational manpower with the skills necessary to stimulate adoption of innovations and more importantly to facilitate high quality implementation after decisions are made to adopt various validated practices.

It is evident that a wide range of skills and functions can and should be grouped together under this "implementer" or "field agent" concept. Among these are the following: team building, attitude changing, training (e.g., in design and conduct of workshops, conferences, and various sorts of collaborative temporary systems), interpersonal tension handling, aiding with decision-making concerning innovation adoptions, system design and redesign, helping with local diagnosis of educational needs and problems, assisting in articulation of information needs and linking to informational resources, making resources visible and consumable (e.g., in the form of information kits and packages, demonstrations, etc.), and the ability to evaluate and train others in the evaluation of innovation impacts and educational outcomes.

Research and development in training program requirements should explore the relative importance of separate skill components and the number of skills that can be meaningfully taught in one training program or realistically invested in one role. It should investigate and experiment with the development of multiple role teams which include a range of these skills from human relations to systems analysis, and from risk-taking support to rigorous evaluation. Intra and inter-role compatibilities and incompatibilities should be explored.

Such projects should also compare the relative advantages and long term viability of role placements with different organizational bases; e.g., state departments or regional offices, intermediate units, universities, and school districts. There may be a special need to explore and design training for collaborative teams of local school staff members (insiders) and professional consultants (outsiders). These inside-outside linkages may be an important avenue to development of self-renewal capacity in schools.

C. METHODOLOGIES TO ASSESS INNOVATIONS AND THEIR CONSEQUENCES

Although many hundreds of studies on educational innovation have been identified in various reviews* it is fair to say that this is one of the youngest and least researched fields in education. Therefore, a programmatic thrust in this area will require some groundwork in the form of methodological studies to establish instrumentation and units of measurement. Studies of this sort should have high benefit-to-cost ratios because both the work of

*e.g., Rogers, E.M. with Shoemaker, F.F., THE COMMUNICATION OF INNOVATIONS, New York, New York: The Free Press, 1971.
Havelock, R.G. with Guskin, A., et al., PLANNING FOR INNOVATION, Ann Arbor, Michigan: University of Michigan, Institute for Social Research Publications, 1969.

innovation researchers and the day-to-day operations of innovators will be facilitated. Furthermore, the existence of commonly-used methodological and conceptual tools will facilitate knowledge development and make isolated studies of innovation less likely. Three areas of needed work are proposed:

1. Tools for the diagnosis and assessment of innovation processes within and between complex organizations.
2. The development of a typology of innovations.
3. Methods for the assessment of the consequences of innovation adoption.

Diagnosis and Assessment Tools

Projects are needed to develop widely usable measures of on-going innovation processes including perceptions of innovators and innovation advocates, user needs, properties of the innovation itself (divisibility, complexity, relative advantage, etc.) and phases of change process and information flow. Focus should be on variables which are manipulable, i.e., subject to change via training or other forms of intervention in a system. Thus they could be used for diagnosis, for selection of sites for innovation spread, and for assessment of change efforts, both in a "steering" and in an evaluative sense. Criterion measures of innovation adoption and implementation are also needed: i.e., standard ways of assessing whether an innovation has been "adopted" and successfully "implemented" which are usable across different innovations and systems. Such measures should include ways to estimate the cost-to-benefit ratio for a given type of user and the continuity of usage over time.

Projects of this sort might be carried out in conjunction with the studies on the flow and fate of innovations discussed earlier but they should include additional steps such as: (a) assembly and critique of existing instruments from currently available published sources; (b) interviews with innovation researchers and practitioners on their tool needs; (c) construction of instruments in gap areas not covered by existing literature.

A Comprehensive Typology of Innovations

The term "innovation" has been used by educators to describe virtually any change which the advocates deemed desirable. Terms such as "individualized instruction" or "team teaching" are widely used to describe changes which have virtually no substantive referents in common. Yet among the tens of thousands of educational changes introduced or attempted every year throughout the U.S., there <u>are</u> many common features whether or not they carry common labels. A comprehensive and logical framework for classifying innovations would form the basis of a shared language regarding educational change management. Such a taxonomy of innovations would allow scholars and policy makers to collate and compare changes in many different and geographically dispersed school settings. Similarly, decision makers at the local level would be able to evaluate the impacts of contemplated changes by drawing on the collective experiences of hundreds of other systems which have tried similar or identical projects. The key to such judgments is valid <u>comparability</u>, and the necessary precursor to valid comparability is a common terminology. Most

innovations presumably contain some functional elements classifiable into some first order taxonomy of variables across innovations. The domain of change needs some mapping; the first kind of mapping is a classification schema of: areas touched on, variables explicit or implicit, dissemination and installation assumptions, and the innovation as mediate, means or a self-contained end. Other schematics are possible according to purpose. From such descriptive mappings some orderly arrangement can be created and new questions raised.

At stake is the usefulness of the concept "innovation" as a variable for dissemination research. The usual definitions of innovation are deceptively simple, all implying some contrast so as to be detectable as "a change." Does substituting one text book for another, altering some section of treatment of minorities in social studies, or a new media, representing a new authority, constitute "innovation," or "change?" Some changes clearly are basic reformulations, epicenters from which countless specific "innovations" ripple out, while others are trivial "add-ons" or rearrangements with only minor and localized consequences.

The National Institute will be by far the most visible and prestigious development organization that has ever existed in the field of education; hence, a well executed taxonomy of educational innovations would probably have considerable impact on the standardization of terminology in what has been, up to now, a confused area both for the researcher and for the practitioner.

Methods for Assessing Innovation Consequences

Work in this area would be substantially advanced by an array of straightforward, practical tools for examining the actual effects of innovation adoption processes, and of the innovation itself, once installed or implemented. Such instruments or methods should be designed to uncover and measure effects at several levels, e.g., consequences specific to the innovation at hand: degree of achievement of its intended effects (pupil achievement, increased motivation to learn, less time required for learning; the presence of unintended effects (side effects, boomerangs, ripples, things no one had anticipated). and various process changes associated with the innovation (e.g., emotional acceptance of the innovation by board, teachers, students, parents; energy outputs required; involvement and interest); and changes in the social environment of the classroom. Attention should also be given to organization-wide consequences which seem to accrue from a series of innovations (e.g., teacher turnover, delinquency and vandalism rates; percentage going on to college; percentage in various curriculum tracks; dropouts; community satisfaction with schools; morale; "self-renewal;" "climate;" degree of distance from wished-for system goals, etc.). Many of these are slippery concepts and it is this slipperiness that such methodological projects would be designed to confront and overcome whenever possible.

Projects should (a) survey practitioners on the data presently used to assess the effects (anticipated and eventual) of innovations; (b) retrieve and critique instruments currently being used as school output measures, and (c) indicate simple methods for contructing instruments to assess specific innovations

with special properties. It might also be important to invite the production of a short monograph reviewing the literature on evaluation research methods, stressing newer models such as quasi-legal (advocacy), Bayesian and decision-theoretic, eco-behavioral (Gump), and social area analysis.

CONCLUDING COMMENT

The above listed project priorities represent only a modest first step in the building of a comprehensive program of R&D on the change process. In the longer run, particularly as other major development efforts of NIE reach the dissemination and utilization stage, the need for a major R&D investment in dissemination and utilization, per se, will become more evident. For a long time we have had little to say in response when the question is put: "What do you have that is worth utilizing?" Already some of the regional laboratory programs have provided us with some tested and useful products which answer that question. NIE in the years ahead promises to provide us with much more that is worth using and worth disseminating for widespread use. But we must make sure that the machinery of delivery to the practitioner is adequate for the task ahead. This is a social engineering task of the highest order. The R&D to ensure the adequacy of this engineering must be done in advance, and the NIE is probably the only organization that can do it.

II. STRATEGIES FOR THE DISSEMINATION AND UTILIZATION EFFORT OF THE NATIONAL INSTITUTE OF EDUCATION

Prepared by William Paisley, for the USOE-NCEC Research Advisory Committee on Change Processes in Education (RACIPE), April 1972*

Recommendations for NIE's program of research on the dissemination and utilization process were presented in Section I. Section II focuses upon NIE's own, operational dissemination and utilization (D&U) program.

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* Much of this section derives from discussion at a meeting of RACIPE on February 22, 1972. RACIPE members present were Richard Carlson (Oregon); Neal Gross (Pennsylvania); Ronald Havelock, chairman (Michigan); Ronald Lippitt (Michigan); William Paisley (Stanford). Federal observers included Thomas Clemens and Ben Sprunger, others for brief periods.

Parts 3 and 4 of this section derive from the RACIPE discussion. Parts 1 and 2 were prepared by Paisley as context for the later discussion.

1. Background

Change occurs naturally throughout society, but at a pace that cannot keep up with technology, growth of knowledge, etc. Accordingly, agencies are created in many sectors of the society to systematize and foster change. In the federal government, the new National Institute of Education has been given a broad mandate to improve education through research and development.

NIE is founded on the belief that educational practice can be improved through large-scale research and development (R&D) efforts. If this belief is to be borne out, in spite of R&D's minor impact on educational practice now, then effective mechanisms must be created to bring R&D products to the attention of educators and to ensure that products receive an adequate field trial.

Around the world, change-oriented agencies have adopted three distinguishable "postures" with regard to the products or reforms they support. Oldest among these is the product-advocacy posture, borrowed from religious and political evangelism. For example, turn-of-the-century populist reformers advocated simple solutions to complicated social problems. Their counterparts in government, in such agencies as the Department of Agriculture and the Public Health Service, were sanguine about hybrid seed and immunization.

When evangelism wears thin, the reaction is a laissez-faire posture. An agency leaves the fate of its product to the market-

place and the astuteness of potential adopters. Since the marketplace is crowded, the product rarely comes to the attention of potential adopters and their astuteness is not tested.

The newest posture that can be seen in change-oriented agencies is that of change-process advocacy. Instead of advocating particular products, which are certain to disappoint some adopters, the agency advocates a strategy of planning and implementing change. Although the agency favors some alternatives because it has invested in them and tested them, it does not risk its credibility in promoting those alternatives. Rather, by guiding potential adopters through a sequence of activities that include need assessment, capability assessment, exploration of alternatives, trial of selected alternatives, evaluation of the trial, implementation of the chosen alternative (etc.), the agency secures a fair trial for the alternatives it supports. It brings about change while preserving the voluntaristic character of the choice among alternatives.

The product-advocacy and laissez-faire postures have simple rationales. They are the "try it -- you'll like it" and "take it or leave it" extremes. Change-process advocacy has a more involuted rationale. Skepticism in the merit of particular alternatives is balanced by belief in flexibility and readiness to change. The improvability of people and situations is a root ethic, but it is not accompanied by any strong conviction that the improvement will occur in the short term.

The evolution of federal D&U for the field of education. In the 15 years since NDEA brought the first large-scale support to educational R&D, we have seen a healthy evolution of D&U strategies focusing on R&D outcomes. While much of USOE adopted the NIH or NSF laissez-faire posture ("We support basic research, not yet applicable to field problems"), various bureaus and divisions engaged in product advocacy. Programmed instruction, educational media, individualized instruction, the resource center concept, reading instruction techniques, drop-out prevention (etc.) exemplify the range of products advocated at one time or another.

The laissez-faire posture preserved USOE's overall credibility, but all the world loves an advocate. For 15 years, educational conventions and educational journals have been spiced by a variety of products bearing something like the USOE stamp of approval. Despite the rapid turnover of products (and advocates), USOE's episodic product-advocacy can be credited with more "good" than its fundamental laissez-faire posture.

The evolution of ERIC encapsulates the larger USOE trend. ERIC was conceived as a knowledge codification-preservation system. Its models were the scientific information systems of physics, chemistry, medical research, etc. To the extent that early ERIC had any change orientation, its files were viewed as the marketplace in which educators shopped for solutions to their problems. Few shopped, and fewer bought.

ERIC was wisely guided out of that early mold by its directors. Leaving ERIC as a knowledge base but reducing its share of USOE's D&U budget, they began to experiment with "active dissemination" programs. Initial effort involved information synthesis and "targeted communication" of the syntheses to selected audiences. There has been a fair amount of product-advocacy in the targeted communication (TC) program, but only because each TC report is like a page ripped out of Consumer Reports. If there were enough money to support the other pages, a single page would seem objective in context.

The targeted communication effort has evolved, most reasonably, into a search for "validated products" that can be advocated. According to the usual regress, the search for validated products has led to a search for validation procedures of an extrinsic or consensual character. These programs of the National Center for Educational Communication, if and when they work out successfully, will legitimate product-advocacy but also render it unnecessary among the large group of educators who are now watching for comparative data on alternatives they are already aware of.

In other words, ERIC (actually NCEC as a whole) has evolved from a laissez-faire posture, through episodes of product-advocacy, into a present and future commitment to change-process advocacy. Product-validation data will be just one element in an emerging "technology" of information processing, alternative testing, and decision making on the part of educators.

In this view of change-process advocacy (which is different, for example, from Buckminster Fuller's), it is both possible and necessary to teach a repertory of skills bearing upon problem formulation, information search, alternative exploration, alternative testing, alternative selection, implementation, maintenance, decision review, etc. In a series of projects, NCEC advocates and develops these skills in educators.

NCEC's full step forward into change-process advocacy comes with the educational extension program, now getting underway. Extension agents, supported with some federal funds but attached to SEA's and LEA's, assist educators in formulating problems, see to it that necessary information is retrieved from ERIC and elsewhere, and in general perform many of the functions of the expert consultant who is unavailable to the average educator.

The combination of extension agents, targeted communication, and the ERIC knowledge base may prove to be one of the most effective D&U strategies of any federal agency. The conception may also have defects and gaps that only time will reveal. Either way, further changes are to be expected in the program, by its very nature.

2. Knowledge production, dissemination, and utilization systems

A characteristic of modern society is multiplicity in knowledge production, dissemination, and utilization systems. Throughout most of modern society there is no shaman, no tribal council, no "only way" of performing personal or social functions. Knowledge production, dissemination, and utilization are all pluralistic, often to the point of "information overload" and "future shock."

Figure 1 illustrates the three interdependent knowledge systems. None is a closed system. All have permeable boundaries and each reacts continuously to developments in the other two systems. Yet each is internally controlled and each responds to different norms and rewards. Even the dissemination system, which seems to exist for the purpose of coupling the production and utilization systems, has norms and rewards that are unrelated to coupling or "throughput," as traditional libraries make us all too aware.

Figure 2 expands the knowledge production system to show some of its internal processes. The list of processes is illustrative. The scope of activity in this system would only be suggested if we listed every internal process of a large university, a research corporation, and a "think tank."

FIGURE 1. The flow of knowledge in education (or any other field of activity).

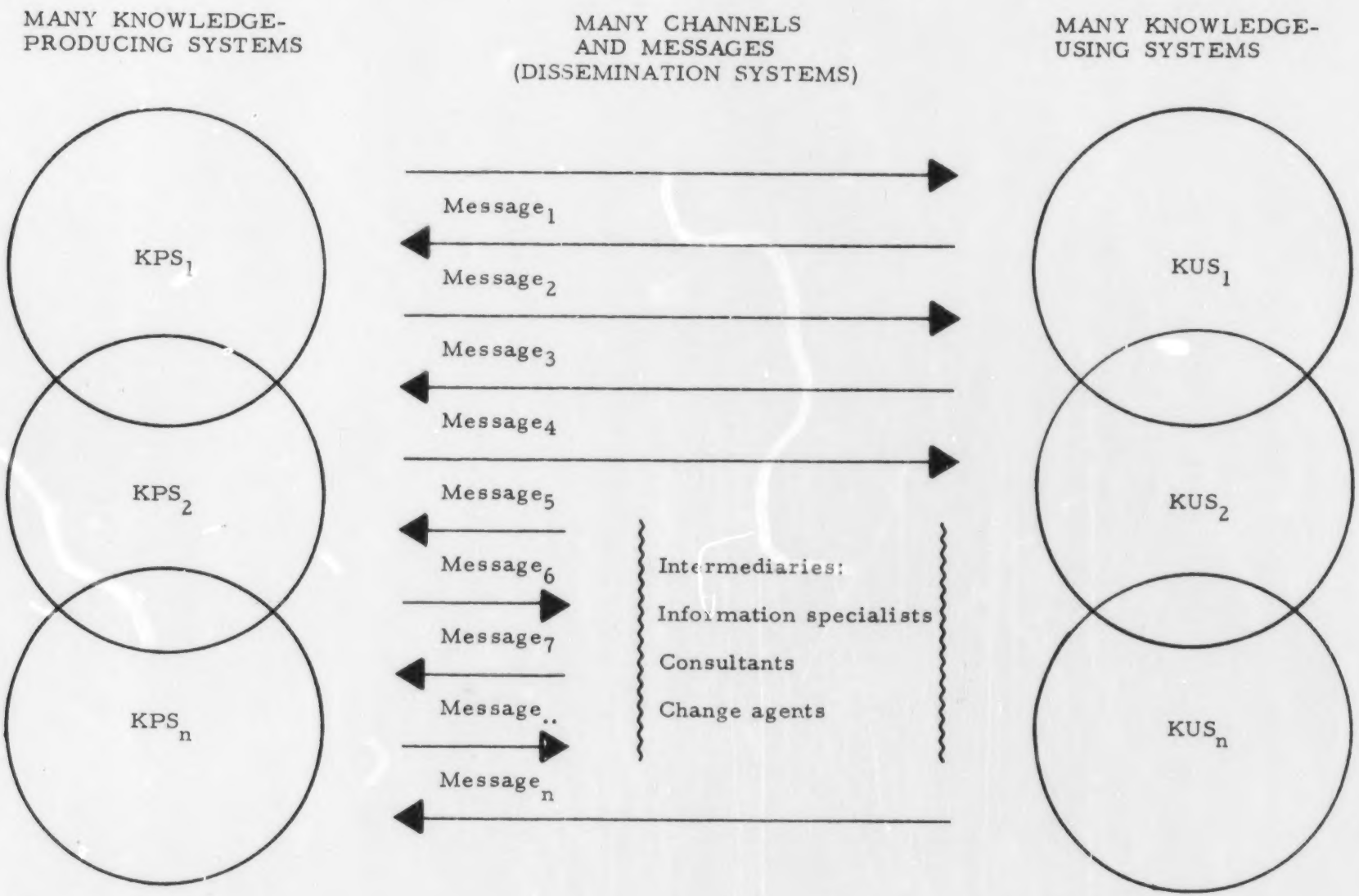

FIGURE 2. Processes within the knowledge-producing system.

Basic (conceptual) research

Applied (conceptual) research

Field needs assessment

Product development

Product testing

Product modification

Product packaging

Knowledge review, synthesis, and codification

Feed-forward to dissemination system

System maintenance:

- Self-criticism
- Training of future knowledge producers
- Arrangements for support

(Etc.)

This page corresponds to the left side of Figure 1

Figure 3 expands the dissemination system to show its internal processes. Again the list is illustrative. A complete list would include the activities of book publishers, journal publishers, libraries and information centers, preprint and manuscript exchange arrangements, bibliographic services, conventions and symposia, continuing professional education programs, mass media, and innumerable personal encounters -- some of which are formalized in extension programs like USOE's.

According to prevailing expert opinion (for example, Ronald Havelock or Charles Jung), the dissemination system must attempt to remedy deficiencies in both of the other systems. If the knowledge-producer is perfunctory in making his work available or comprehensible, the dissemination specialist ferrets it out and transforms it according to the needs of particular users. If the knowledge-user is inept in analyzing his needs, the dissemination specialist assists him and then searches the knowledge base on his behalf. The role of the "knowledge linker" (Havelock) or "consultant" (Jung) is a very demanding one. USOE-NCEC is currently wrestling with the problem of specifying a manageable set of functions for extension agents.

Figure 4 expands the internal processes of the knowledge utilization system. Some of these have been stated elsewhere (for example, by Everett Rogers) as phases in the adoption of innovations, and of course they are. However, "innovation"

FIGURE 3. Processes within the dissemination system.

This page corresponds to the center of Figure 1

Creation of channels
Adaptation of channels to messages and audiences
Creation or transformation of messages
Mass production of messages
Assessment of user needs
Assessment of knowledge availability
Development of strategies for matching available knowledge to needs
Development of secondary knowledge bases
Development of knowledge access tools
System maintenance:
Self-criticism
Training of future dissemination specialists
Arrangements for support
(Etc.)

FIGURE 4. Processes within the knowledge-using system.

Need assessment

Capability assessment

Knowledge searching

Exploration of alternative solutions to identified problems

Trial implementation of one or more alternative solutions

Evaluation of trial implementation

Full-scale implementation

Systemic restructuring, as necessary, to accommodate change

Maintenance of change

System maintenance:

- Self-criticism
- Training of future professionals
- Arrangements for support

(Etc.)

This page corresponds to the right side of Figure 1

connotes products and procedures, not new concepts per se. Knowledge utilization is the more generic term for this system; it encompasses new ways of thinking as well as new products and procedures.

The nature of these vital, ever-changing systems cannot be captured in circles or lists. The knowledge production system is also a major knowledge utilization system. Scientific information systems exist to close this loop (from researcher to researcher). The knowledge utilization system produces vast amounts of knowledge itself, of an experiential or field-trial character. Such knowledge is often lost from the system, because practitioners are not encouraged or assisted in sharing their insights or "better mousetraps." To the extent that all of us are "dissemination specialists" on occasion, that system is also ambiguous.

However, the terminology that describes these knowledge systems and the relationships depicted in Figure 1 will be convenient points of reference in later sections of this paper.

3. The larger context of trends and values

Certain trends in American education indicate a different course for the NIE D&U effort than would have been true ten years ago. Some of these trends are:

Education as a community-wide concern. The schoolteacher, physician, lawyer, and preacher are no longer the only educated residents of a community. Even in traditional "book learning," many groups and institutions in the community are fully able to share the school's responsibility. Nontraditional educational activities, ranging from compensatory and enrichment programs to vocational training, have already moved out into the community. Nonschool educational activities will increase, involving more and more community resources, and school itself will become a moveable feast.

NIE D&U effort must take account of education's new sites and its new participants. The latter, which include nonprofessionals and paraprofessionals, have greater need for the dissemination product, yet are harder to reach.

Education as a lifelong concern. The Carnegie Commission report, Less Time, More Options, noted that a trend toward lifelong learning was well underway. As the school and other community facilities become drop-in centers for lifelong learning, dissemination must be relevant to educational activities outside the K-16 sequence.

Decentralized decision making. Dissemination is simplest when decision making authority is centralized. In the future, however, it will not be sufficient to reach only the superintendent or principal. Teachers and students are successfully claiming the right to participate in decisions that affect the collective enterprise. These groups will be especially sensitive to the possibility of exclusion from D&U efforts. The problem -- and the sensitivity -- are compounded when the teachers or students represent an ethnic minority as well.

Finance, governance, and adversary communication. Education has used up its tradition of polite discourse. The divisive topics of finance and governance have moved to center stage. Neutral communication has given way to adversary communication.

The NIE dissemination unit will face many difficult decisions in these topic areas, which can neither be avoided nor treated to everyone's (perhaps anyone's) satisfaction.

Educational "war zones." Some urban areas in this country have become "war zones" in which conventional education is paralyzed and ad hoc alternatives only occasionally succeed. There is a tendency in educational D&U to ignore these "war zones" because the educational problem seems so deeply ramified in noneducational factors. As a consequence, few D&U strategies have been developed to reach educators, students, or parents in these areas.

NIE's commitment to concentrate on these "war zones" will require new solutions to old D&U problems. Even the information processing and decision making behavior of educators in these settings is an unresearched factor in the success of D&U.

The value context. Many currently held values in education impinge on the D&U effort -- for example, individualization of student experiences, curriculum relevance, accountability for funds and labor committed, etc. Three values that bear directly on D&U policy are:

1. The educator should have maximum freedom to choose among alternatives according to their cost-effectiveness and other merits as he perceives them. That is, the necessary conditions of choice (prerogative, competence, financial capability, etc.) should not be used by others to abridge the educator's right to practice his profession in ways that seem most effective to him. Some constraints of coordination and large-scale adoption are necessary. Others are unnecessary; they are symbols of authority per se.

As a corollary to #1, the D&U system should never be pre-emptive or coercive. Most persuasion or other choice-forcing strategies are not legitimate in D&U.

2. The educator should have knowledge of the broadest range of alternatives. Choice is not free if the educator only has a few similar alternatives to choose from. The broadest range of alternatives,

from the conservative to the radical, should be brought clearly to his attention. (It can be said to ERIC's credit that anti-establishment and counter-culture documents have been included in the system, although the ERIC acquisition net catches only a small number of them.)

3. The educator should be protected, as far as possible, from making a poor choice. The role of #3 is best illustrated by analogy. We place a high value on our freedom to choose a personal physician (cf. #1). When making the choice, we wish to have a number of physicians to choose from -- not just two or three (cf. #2). We also wish assurance, from the county medical board or otherwise, that physicians on the list are not quacks (cf. #3).

There is not much deliberate fraud in educational product advertising, but there are many overblown promises and specious validation claims. Without abridging his freedom of choice, the educator should be warned of discrepancies between fact and fantasy in the educational marketplace.

The value of freedom, the value of range, and the value of reliability should be acknowledged and enhanced by NIE's D&U system.

4. Recommendations

First, it is recommended that NIE's D&U planning unit take account of the following propositions, all of which have empirical support:

1. Left to itself, education's "natural" D&U network brings about rapid change in advantaged districts, slow change in disadvantaged districts. The "natural" D&U network widens the gap between the haves and have-nots.

2. D&U dynamics -- for example, the adoption of innovations -- are generalizable across settings and innovations. These dynamics need not be rediscovered for NIE's D&U planning purposes.

3. The lasting effect of D&U is "people change," not "thing change." This is the reason why, for example, efforts to introduce educational technology in the schools largely failed during the 1960's.

4. Adapting behavior is more common than adopting behavior. People find it necessary or desirable to modify innovations in the process of adopting them. In some cases this leads to unintended subversion of the goals of the innovation.

5. Effective D&U depends on multi-channel synergy. No single D&U system in a country like the United States commands more than a small fraction of attention in its target audiences. Communication research literature on the "obstinate audience" reveals the intractability of the problem. Only when multiple D&U systems coordinate their efforts is the outcome successful.

Given these propositions, which are of course only a partial list, we recommend:

R1. NIE should advocate processes for solving problems, but usually not advocate particular solutions. In other words, NIE should launch its D&U efforts in the era of change-process advocacy and not recapitulate the product advocacy and laissez-faire eras of other agencies.

R2. Corollary to R1, NIE should provide materials and other assistance in support of rational decision-making among educators. The materials and assistance would be procedural (guidance in problem solving) as well as substantive (alternative solutions).

R3. At the beginning of these processes (R1 & R2), NIE should stress the importance of need assessment and capability assessment. It will be necessary to provide assistance in the conduct of such assessments. NIE may wish to assign D&U manpower to meet this need, since successful D&U and rational decision-making are both founded on knowledge of need and capability.

R4. NIE's D&U program should be directed toward long-term rather than short-term successes. At the end of ten years, more change will have occurred if NIE first builds an atmosphere of trust and confidence within the D&U network and does not try to force-feed innovations in schools where they are not wanted or needed.

R5. NIE should emphasize, in its D&U effort, demonstrably effective alternative solutions to educational problems. The Institute should support development of alternative solutions through the entire

R&D cycle, but it should also seek to validate existing alternatives, as NCEC now seeks to do. Even if only a fraction of the existing alternatives are valid (this seems to be the case, according to NCEC-ETS study of the matter), it will be cheaper and faster to move these out into D&U channels than to base all NIE dissemination on NIE's own, new research.

R6. NIE should recognize the complexity of, and provide for, the implementation phase that comes between D and U. Implementation failures are a common cause of poor outcomes in later evaluations. Many programs are faulted for poor performance when, in fact, they never got off the ground.

R7. Vis-a-vis other agencies, professional associations, publishers, etc., NIE should avail itself of every opportunity to coordinate efforts for the sake of synergy. "Going it alone" is a prescription for failure. The cooperative arrangements that NCEC has developed should be studied with care, in their historical context. However, a new agency should be able to establish a broader network of cooperation.

R8. Natural networks of communication and influence among educators should be used wherever possible. Familiar principles of "gatekeeping" and "opinion leadership" in such networks can guide NIE's strategy of entering the networks.

R9. NIE should facilitate the creation of user coalitions to attack major education problems. D&U then flows within the knowledge utilization system, not just into the knowledge utilization system from the knowledge production system.

R10. New communication technology should be included in the D&U system as soon as it proves itself in particular applications. User-controlled media such as audio and video cassettes are ready for D&U application now, particularly for "current awareness" and inservice training. Cable television is leading to "wired communities" which, by FCC requirement, have extra channel capacity for professional communication. These systems will be useful to educators, physicians, etc. NIE should watch these developments closely and prepare dissemination program material when the time is ripe.

R11. NIE's D&U planning should involve representation from all levels of educational systems, perhaps in the form of an advisory panel. Such input not only "certifies" the D&U effort to various constituencies, but the current field experience of panelists may help to reveal defects or gaps in the plan.

R12. All D&U programs should be introduced as experimental or provisional in nature, subject to modification after evaluation. Alternative strategies should be tested in true field experiments in different regions of the country (randomized block design). Single strategies should not be oversold, because later modification or deletion is then an embarrassment to the agency.

R13. Inasmuch as many factors in successful D&U have yet to be researched and understood, NIE should support continuing research on the D&U process, combining programmed (solicited and specified) as well as unprogrammed (unsolicited and unspecified) projects. Fruitful areas of inquiry have been described in Ronald Havelock's position paper to NIE.

Detailed recommendations for NIE dissemination and utilization activities will be premature until relationships between NIE and USOE are sorted out. Between the two agencies there needs to be:

-- ERIC or an ERIC-like facility to maintain and update the educational knowledge base;
-- an office for cooperation with states in dissemination and utilization activities (an extension program, joint publishing/distribution arrangements, demonstration sites, inservice workshops, etc.);
-- an office for producing or commissioning targeted communications;

-- an office that keeps abreast of, and stimulates development in, information technology such as microform systems, computer retrieval, and cartridge media;

-- an office that supports research on the dissemination and utilization process.